Test Equipment

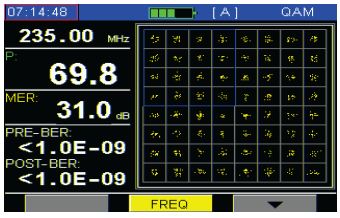
DS2400Q
QAM Analysis Multifunction Meter

Description

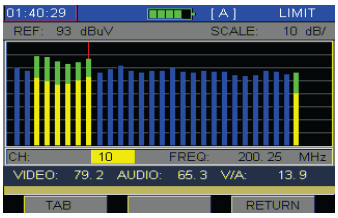
The DS2400Q is a multifunction instrument, which supports QAM constellation and analog signals for CATV networks. It is the most cost-effective and performing tool for the initial network construction, for subscriber installations as well as for service and troubleshooting tasks. Its ruggedized design, which includes a shock protector, combined with its icon display GUI and its AUTO pass/fail specified limit feature provides increased efficiency and productivity for all types of technicians.

Other features like return path & forward spectrum scan, 12 favorite tilt frequencies, AC line voltage test as well as HUM and DC voltage measurements, combined with complete data logging and a management software makes this unit a versatile tool for cable operations.

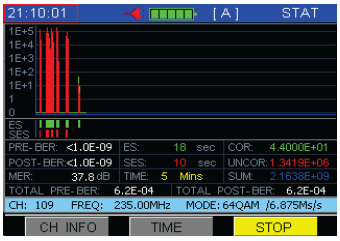
MER, Pre & Post BER measurements combined with BER statistics feature addressing errors, corrected and uncorrected bits per second allows quick testing of loose connections related to *pixelating* or slow DS internet data flow. This function allows verifying for mismatches caused by open coaxial lines or corroded devices.



MER w/ PRE & POST BER

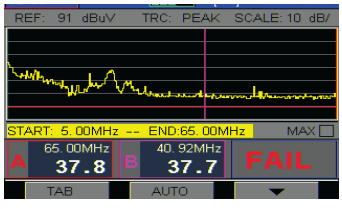


Scan Test

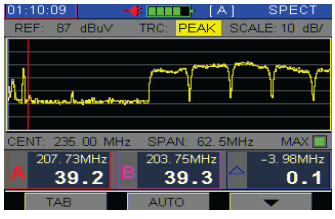


ES & SES + CORR & UNCORR

TILT (Max 12 Freq.)



Return Path Spectrum (5~65)



Forward Spectrum

Features

- ✓ 5 MHz ~1 GHz range (analog/digital signals)
- ✓ Multiple user channel plans with learn mode
- ✓ QAM, QPSK, COFDM power measurements
- ✓ QAM MER w/constellation display
- ✓ Pre and Post BER analysis
- ✓ BER, ES, SES, COR/UNCOR bps
- ✓ Return Path & FWD spectrums scan
- ✓ Pass/Fail limit test functions w/AUTO storage
- ✓ Tilt measurements display (12 frequencies)
- ✓ AC-DC voltage measurements including HUM
- ✓ Measurement data storage capability
- ✓ User-friendly operation (ICON-GUI)
- ✓ Color display 2.8” (320×240 OLED)
- ✓ Management PC software included – Toolbox

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Details of Features and Benefits

Five Multi-user Defined Channel Plans

Several technicians or contractors work with more than one HFC network and it is very practical to have different channel lineups to choose from 5 to 1000 Mhz. In fact, the unit allows up to five (5) different user defined channel plans to be included with this model. Analog, digital and custom frequencies can be configured in the unit by using the automated learned channel plan from an RF drop or by downloading from the PC file using the Toolbox software, which is supplied free of charge with each unit. The user can select up to 12 frequencies in each of the 5 user defined plans and assign them to a Favorite/Tilt channel plan.

QAM Analysis and Channel Measurements

MER plus PRE & POST BER measurements with a several time slots (5 minutes, 15 minutes, 30 minutes, 60 minutes, 2 hours, 6 hours, 12 hours, 24 hours, and 48 hours) can be analyzed with this model. This includes the viewing of the constellation diagram. The unit is compatible with 16/32/64/128/256 QAM modulation and provides power measurements feature of QPSK and COFDM digital carriers.

Spectrum Analysis and Measurements

The DS2400Q has a spectrum mode, which allows seeing the full spectrum. For troubleshooting reverse path challenges, the unit can set to display 5 to 65 MHz frequency spans providing an additional feature to the technician when dealing with upstream data signals. The marker function is included with the spectrum mode and transient anomalies can be captured with the max hold feature.

Full Spectrum Scans with Marker Feature

The DS2400Q supports 160 channels scanning function allowing testing the flatness and the amplitude of the HFC network quickly. With the help of the marker the technician can quickly determine the anomalies related to mismatches caused by poor grounding or damaged transmission lines.

HUM Network Measurement

The Hum measurement function helps the technician identify and troubleshoot anomalies, which may result from defective capacitors, faulty line splitters, or couplers from lightning or excessive current overloads. Both 60 & 120 Hz tests are performed w/400Hz LPF measurements.

Auto Diagnostic User-defined Limit Test (Pass/Fail)

This function allows the user to determine whether or not the various parameters and associated measurements, which have been configured in the unit, have been met. The pass/fail limit tests may include Power levels, MER, PRE-BER, POST-BER, Spectrum Analysis, Tilt, and HUM measurements. With a simple keystroke, the technician will no longer be required to manually take note of the results. As a result, more installations or service calls may be performed in a day. Additionally, the fact that every measurement is recorded; there is no room for errors. This forces performance accountability of each location, thus avoiding churn, which may be costly to the organization.

User-defined Tests

Thanks to the five (5) channel plans and the ability to group various tests, which can be performed with a simple icon selection, the technician's role becomes very efficient and productive. The tests may include Level, Tilt, Spectrum Analysis, HUM and Performance related Test Limits for both analog and digital carriers.
Once the test data results are stored in the instrument, they can be recalled, viewed, and analyzed.

File Management - Test Data Storage

Several test data can be saved and stored as such: Analog carriers or frequencies, QAM carriers or digital frequencies, channel scan, tilt, frequency spectrum measurement and HUM.
The results are saved in the File Directory menu, listing the name of the file, time and date. These data records may be uploaded to a PC with the complimentary Toolbox software for reports, analysis, and printing.

Voltage Measurement - Battery and Charging

The unit can measure battery voltage, trunk & distribution line voltage of the cable system, identifying AC or DC automatically. With the intelligent power management system, the battery provides approximately 5 hours of continued operations when fully charged.

Standard Accessories

With the SD 2400Q model the following accessories are included: Protector rubber bumper, carrying bag with shoulder strap, data cable (serial to USB), two (2) "F" connectors, AC/DC power adaptor/charger, Toolbox software and user's manual.

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Specifications

Frequency	Range: 5 MHz to 1000 MHz Accuracy: ± 50 ppm (@ 20°C ±5°C) Resolution: 10 KHz
Channel Type	Analog TV: NTSC Digital TV: QAM 16/32/64/128/256 with constellation diagram plus QPSK and COFDM FM Radio: Single frequency
Digital Channel	Demodulation type: Standard ITU-T J.83 Annex A/B/C Support : QAM 16/32/64/128/256, QPSK and COFDM Symbol rate: 1 MS/sec to 7 MS/sec Bandwidth: 280 KHz to 10 MHz MER (Modulation Error Ratio): 39 dB (QAM) Accuracy : ±2.0 dB BER (Bit Error Rate): $1E^{-3}$ to $1E^{-9}$ before and after R-S decoding (QAM) Power measurement type: QAM, QPSK and COFDM
Digital Channel Average Power	Level range: -30 dBmV to +60 dBmV
Constellation	Accuracy : ±2.0 dB from 10°C to 30°C and ±3.0 dB from -10°C to 40°C Resolution: 0.1 dB Display mode: QAM 64 and QAM 256 with zoom in and zoom out capability
Analog Level Measurement	Range: -35 dBmV to +60 dBmV Accuracy: ±1.5 dB Resolution: 0.1 dB Input impedance: 75Ω ("F" type connector)
HUM Modulation	Range: 2% to 5%
Channel Scan	Number of Channels: 160 channels max Scanning Speed: 5 channels per second Scale: 1, 2, 5, 10 dB/div Zoom: 1X, 2X, 3X, 4X, 5X five levels of magnification or full channel scan
Frequency Spectrum	Bandwidth: 2.5MHz, 6.25 MHz, 12.5 MHz, 25 MHz, 62.5 MHz and full span Scale: 1 dB, 2 dB, 5 dB and 10 dB/div
Tilt Measurement	Number of Frequencies: maximum 12 with 0.1 dB of resolution
Limit Test Parameters	Minimum/Maximum Video Level: 0 dBmV to + 30 dBmV Minimum/Maximum Δ V/A: 10 dB to 20 dB Minimum/Maximum Power Level: -10 dBmV to +30 dBmV Minimum MER: 33 dB (varies with modulations and systems) Max PRE/POST BER: $1.0E^{-9}$
Auto-Test	Number of programs: Maximum 7 test parameters
Line Voltage Measurement	Range: 0 V to 100 V (AC/DC) with accuracy of ±2 V
Storage	Memory: 512K byte
Power	Battery: 11.1V 1.6AH Lithium battery (5 hours of operation) Charger: AC 100V to 240V 50-60Hz; charge time approximately 3 hours
Communication Port	Adaptor: RS 232C (With Serial to USB data cable included)
Dimensions (H x W x D) & Weight	218mm × 95mm × 49mm (8.52" x 3.74" x 1.93"); 700 grams (1.54 lb)

* SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

For more information on our products, please visit: www.electroline.com or call: 800-461-3344

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